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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,550	12/14/2001	Wha Seop Lee	MR2685-105	3295

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EXAMINER	
CECIL, TERRY K	

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/014,550	LEE ET AL.	
	Examiner	Art Unit	
	Mr. Terry K. Cecil	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2004* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1-2, 4-10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simm et al. (US 4,069,026) in view of Berry (U.S. 5,024,789).

With respect to claim 1, Simm et al. disclose a method for preparing a thin fiber-structure polymer web (4) comprising the steps of :

- dissolving a polymer in a volatile solvent used as a polymer solvent to prepare a polymer solution;
- spinning the polymer solution by electrospinning (i.e. electrostatic spinning process);
- compulsorily discharging (i.e. venting) air containing a large amount of solvent (evaporated solvent) externally (via an exhaust vent 10) while injecting air into a working space (by spraying/created in a spray chamber 9) during the electrospinning; and

• forming a thin fiber-structured web (4) cumulated on a collector (2, 5), as in fig. 1 and cols. 1 – 4.

Simms does not disclose electrospinning with a maximal voltage of 16kV (interpreted as a range less than or equal to 16kV) nor producing a web having a thickness in a range of from 1 to 100 microns. However such is taught by Berry. Berry teaches layers of polymeric material in a range of e.g. 10 to 60 microns (col. 2, lines 22-30) using voltages within applicants claimed range (see col. 5, lines 10-46) [as in claim 1]. It is considered that it would have been obvious to one ordinarily skilled in the art at the time of the invention to have the step of applying the voltages to produce thin layers of Berry in the method Simms, since Berry teaches the benefit of controlling material characteristics of the polymeric layers produced (col. 6, lines 45-50) to e.g. reduce kinking (col. 6, lines 40-42) which would affect filterability of the Simms mat.

Concerning claim 2, Simm et al. further disclose the volatile solvent being at least one having high volatility in the form of methylene chloride or chloroform, as in col. 2, lines 14 – 16 and in claims 9 – 10 in col. 6.

With respect to claim 4, Simm et al. also disclose the relative humidity in the working space for electrospinning being less than 40%, which includes those values in claimed range of 0 to 40%, as in col. 2, lines 50 – 51.

Regarding claim 6, Simm et al. further disclose the content of the polymer used in the preparation of the polymer solution is within the claimed range of 0.1 to 40 wt% based on the content of the solvent, as in examples 1 – 3.

Concerning claim 7, Simm et al. also disclose the polymer may be selected from polystyrene, polyacrylonitrile, cellulose esters (which include cellulose acetates) or polycarbonate, as in col. 2, lines 11 – 14 and examples 1 – 3.

With regards to claim 10, Simm et al. further disclose the collector (5) having its upper part provided with a filtering medium in the form of a gas permeable support layer (i.e. cellulose fleeces), as in col. 3, lines 9 – 11 and example 1.

With respect to claim 12, Simm et al. disclose a thin (having a thickness of at least less than 1 μm) fiber-structured polymer web (4, fibre filter in examples 1 - 3) obtained by the method of claim 1, as in fig. 1 and in cols. 1 – 4.

Concerning claim 13, Simm et al. disclose a filter (20, 21) obtained by laminating the thin fiber-structured polymer web (4) manufactured by the method of claim 1, as in figs. 1 & 4 and in cols. 1 – 4.

Regarding claim 5, although Simm et al. do not teach the temperature of the polymer solution being in the range of 40 degrees Celsius to the boiling point of the solvent, it is considered

obvious to one of ordinary skill in the art that the temperature of the polymer solution can be modified and optimized in order to achieve the thin/thickness desired by the manufacturer of the polymer web, and is dependent upon desired thickness (i.e. thin values) of the resulting fibre web/filter product. The values of the temperature of 40 degrees Celsius to the boiling point of the solvent, are considered to be optimum values of a result effective variable in a known process, in this instance, in providing the desired "thin fiber-structured polymer web". The case law, **In re Boesch,** 617 F.2d 272, 205 USPQ 215 (CCPA 1980) has stated:

"The discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art, and thus a prima facie case of obviousness is established."

With respect to claim 8, Simm et al. further disclose the polymer may be mixed with an organic salt, which could be in the form of a powdered substance or in liquid form, to increase the conductivity of the polymer solution, thereby allowing the thickness of fibers of the fiber-structured web to be adjusted (i.e. to form thinner fibers) accordingly, as in col. 2, lines 33 – 45. The case law, ***In re Dailey***, 357 F.2d 669, 149 USPQ 47 (CCPA 1966), provided (The court held) that the configuration (i.e. form being a powdered substance or a liquid) of the claimed invention, which in this instance, the organic salt to be mixed with the polymer, was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration/form of the claimed invention was significant.

With regards to claim 9, Simm et al. also disclose the collector (2, 5) being an electrode, which could be an anode or cathode (i.e. a positive charged electrode), as in cols. 2 – 4. Although

Simm et al. do not teach specifically what type of material to form the anode or cathode collector, it is considered by one of ordinary skill in the art to modify the anode or cathode collector to a particular/specific type (in this instance a cathode formed of a carbon material, tin oxide or lithium compounds, etc.) as an obvious modification as merely a choice material for the cathode collector. The case law ***In re Leshin***, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) stated that a prima case of obviousness exists in a selection of (a known plastic, or) in this instance, a cathode collector made of a carbon material, tin oxide or one of those materials claimed by the invention in claim 9, to make a (container) in this instance, a positive/cathode collector of a type made of (plastics) in this case, cathode/positive materials prior to the invention.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simm et al. in view of Berry, as applied above and in further view of Fine et al. (US 4,223,101).

Concerning claim 3, Simm et al. fail to disclose the solvent being a mixed solvent comprising at least one relatively high-volatility solvent and at least one relatively low-volatility solvent as recited in this claim. However, Fine et al. teach a similar method for preparing a thin fiber-structured polymer web similar to Simm et al., the method of Fine et al. including dissolving a polymer (such as polyurethane) in a volatile solvent, spinning the polymer solution by electrospinning and forming a thin fiber-structured polymer web cumulated on a collector, wherein the volatile solvent could be a mixed solvent of at least one relatively high-volatility solvent in the form of tetrahydrofuran and at least one relatively low-volatility solvent in the form of a N-N-dimethylformamide, as in cols. 1 – 8.

It is considered obvious to one of ordinary skill in the art at the time of the invention to modify the method of Simm, as modified by Berry, by substituting the volatile solvent used in the method of Simm et al., in lieu of the mixed solvent taught by Fine et al., in order to provide an alternative volatile solvent which can be more readily available, or provide a solvent which is less volatile, thereby making the method of manufacturing the polymer web be operable/can be performed at conditions of high relative humidity, and depending upon the solubility of the polymer used in making the polymer web (see cols. 5 – 6 of Fine et al.).

Response to Arguments

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Contact Information:

- Examiner Mr. Terry K. Cecil can be reached at (571) 272-1138 at the Carlisle campus in Alexandria, Virginia for any inquiries concerning this communication or earlier communications from the examiner. Note that the examiner is on the increased flextime schedule but can normally be found in the office during the hours of 8:30a to 4:30p, on at least four days during the week M-F.
- Wanda Walker, the examiner's supervisor, can be reached at (571) 272-1151 if attempts to reach the examiner are unsuccessful.
- The Fax number for this art unit for official faxes is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mr. Terry K. Cecil
Primary Examiner
Art Unit 1723

TKC
August 19, 2004